UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/508,344	06/28/2005	Takeshi Arai	ITO-C477	5730

7590 10/09/2008

George A. Loud, Esquire
BACON & THOMAS
625 Slaters Lane, Fourth Floor
Alexandria, VA 22314-1176

EXAMINER	
WU, IVES J	

ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
10/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/508,344	ARAI, TAKESHI	
	Examiner	Art Unit	
	IVES WU	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6,9 and 13-20* is/are rejected.

7)☒ Claim(s) *3-5,7,8 and 10-12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

(1). Applicant's Amendments and Remarks filed on 07/21/2008 have been received.

Claims 1-2 and 7 are amended. New claims 13-20 are added.

The rejections of claims 1-12 in prior Office Action dated 04/21/2008 is withdrawn in view of current Amendments and Remarks.

However, a new ground of rejections for claims 1-20 is introduced as following.

Specification

(2). The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

In claim 1, it recites: Wherein said air inlet is located below and spaced from said spray means. The limitation is not literally supported in the Applicant's Specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(3). **Claims 18-20** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claims 18-20, it recites: filter is dry. It is not supported literally in Applicant's Specification. Therefore, claims 18-20 are rejected because of new matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

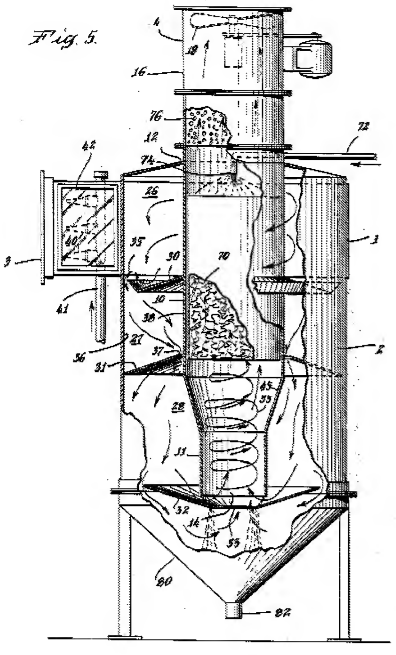
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(4). **Claims 1-2, 6, 9, 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wisting (US 3989488) in view of Pircon (US 41290670).

As to a dust collector comprising 1) an upright tubular main body closed at top and bottom, 2) a tubular partition wall of a reduced diameter concentrically arranged internally of main body to define a centrally located filtration chamber, 3) an annular cyclone chamber situated outwardly of the filter chamber, the lower edge of partition wall terminating upwardly away from the bottom of main body so that filtration chamber and cyclone chamber to be in communication with each other at lower part in **independent claim 1**, Wisting (US 39989488) discloses an air scrubber employing means which cause the air entering the scrubber to follow a circular path is provided for removing solid, liquid and gaseous contaminants from air. Removal is through a liquid contact system in which slow-moving contact with cleaning water is alternated with intimate turbulent contact. The circular air flow travels in a generally downward direction through a multiplicity of stages to a water and contaminant receiving tank and then the air and some water are drawn upwardly through an internal co-axial outlet expanding diameter so that only air is removed (Abstract, line 13), as illustrated in Figure below, which reads on the limitations of instant claim.

As to dust collector further comprising a filter arranged in the filtration chamber and made of a filtration material for collecting submicron size particles; and means for applying vacuum to the secondary side of filter in **independent claim 1**, Wisting (US 3989488) discloses

a moisture extractor 76 and outlet fan 18 as shown in the Figure below, which reads on the limitations of instant claim. Furthermore, to choose known material for suitability renders obvious. *In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).*



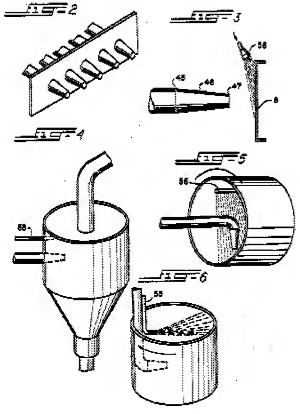
As to main body being provided with an air inlet opening tangentially to the upper part of cyclone chamber and a drain opening located at the bottom in a dust collector in **independent claim 1**, Wisting (US03989488) discloses air inlet 3 to be positioned to one side, it directs the air in a circular pattern (the air passes in a circular manner through chamber 26 in the direction shown by the dotted arrows in Figure 2) (Col. 3, line 31-36). Outlet for waste or salvage would be a tube 82 at bottom with the necessary valving structure (Col. 6, line 49-51), which are illustrated in the Figure above.

As to the upper part of cyclone chamber, for forming a film of water flowing down along the inner circumferential surface of main body and the outer circumferential surface of partition wall respectively, to ensure that a swirling stream of air to be treated drawn through air inlet into cyclone chamber is brought into contact with water film to thereby cause airborne dust and particles in the air to be treated to be captured therein and to cause captured dust and particles to be washed away in the dust collector in **independent claim 1**, Wisting (US 3989488) discloses, in the chamber 26, the motion of the water throughout the chamber to be such that a certain percentage of it will impinge on the inner surface 35 of scrubber tank 2 and on the outer surface 38 of the outet tube 10. these surfaces will remain wet throughout all of the stages of operation of the scrubber. By remaining wet, this provides an additional basis for removal of contamination in the air (Col. 4, line 24-31). In the chamber 27, once again, it will be noted that the inner surfaces 36 and 38 will be wet and so provide an additional scrubbing action (Col. 4, line 66-68). The water in the air-water mixture in chamber 28 either remains admixed with the air or settles on the inner surface 36 of scrubber tank 2, the outer surface 38 of outlet tube 11. That water which is on the inner surface 36 will flow downwardly into tank 20. the water on the surface 38 will flow down the outside portion of the lower end of tube 11 and will drop with a "waterfall" effect into trough 32 (Col. 5, line 29-37), since both divider 30 and 31 are trough for water, then the disclosure of three chambers would read on the limitations of instant claim.

As to spray means directing substantially the entire amount of water supplied thereto onto the inner circumferential surface of main body and the outer circumferential surface of partition wall whereby substantially entire amount of water is consumed in the formation of water films in the dust collector in **independent claim 1**, air inlet being located below and spaced from spray means in **claim 2**, Wisting (US 39989488) discloses, when using steam to remove particulate

matter it is preferably to have the steam enter the air stream in the direction opposite to the direction of air stream and so nozzles 40 are shown in reverse direction (Col. 6, line 26-29). Wisting **does not teach** the spraying entire amount water onto the inner circumferential surface of main body as well as the outer circumferential surface of partition wall whereby substantially entire amount of water is consumed in the formation of water films as claimed.

However, Pircon (US 4120670) **teaches** pollution control apparatus and method (Title). It is illustrated in the Figures below. Apparatus operating at low pressure drop and low initial velocity for removing pollutants down to submicron sizes from gas stream comprising a nozzle means accelerating the gas flow to about four times its entering velocity into a large expansion chamber having an impinger area for removal of pollutant as specially shown in Figures 3 and 4 (Abstract, line 1-6), which reads on the limitations of instant claim.



The advantages of using impinger area is to remove pollutants down to sub-micron size at high efficiency by passing the polluted gas through a nozzle having specific geometry into an

expansion chamber and impinging the pollutants upon an impinging area and removing them from the system (Abstract, line 6-11).

Therefore, it would have been obvious at time of the invention to replace the spray method of Wisting by the method of impinger disclosed by Pircon in the multi-stage air scrubbing unit of Wisting in order to achieve the advantages herein above. Furthermore, it would be obvious to have several spray nozzles located above the air stream input as shown in the Figure 4 because the impinger area would be the whole circular areas of inner circumferential of main body and outer circumferential of inner tube so that the spraying covers the entire impinger area.

As to one or more outwardly open supplemental drain openings provided at the lower part or bottom of main body in **claims 6** and **9**, it would obvious to have one or more drain openings at lower part of the main body. Although the reference did not disclose a plurality of drain openings, the court held mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza, 274 F.2d 669, 124 USPQ 378)CCPA 1960).*

As to spray means being an annular member with a plurality of nozzles which spray the water horizontally onto the inner circumferential surface of main body and onto the outer circumferential surface of partition wall in **claim 17**, as shown in the Figure 4 and 6 of Pircon (US 4120670), it reads on the horizontal spray. It would be obvious to have several spray nozzles located above the air stream input as shown in the Figure 4 of Pircon (US 4120670) because the impinger area would be the whole circular areas of inner circumferential of main body and outer circumferential of inner tube so that the spraying covers the entire impinger area. Also, it would be obvious to have an annular member with a plurality of nozzles because design change does not affect the functions. MPEP §§ 2144.04.

(5). **Claims 13-14, 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wisting (US 3989488) in view of Pircon (US 41290670), further in view of Johnson et al (US 7115150B2).

As to the filter comprising a plurality of tubular filter elements extending in parallel within filtration chamber in **claim 13**, each filter element comprising a pleated filter materials in

claim 14, Wisting (US 3989488) discloses the condensation packing 50, water extractor 50 (Col. 3, line 55, col. 5, line 61). Wisting **does not teach** the multiple tubular pleated filters as claimed.

However, Johnson et al (US 7115150B2) **teach** mist filtration arrangements for mist removal including a barrier media, usually pleated and treated with a deposit of fine fibers. Filter arrangements may take the form of tubular, radially sealing elements; tubular, axial sealing elements; forward flow air cleaners; reverse flow air cleaners; and panel filters and can have multiple layers of fine fiber containing pleated media (Abstract).

The advantage of mist filtration arrangements of Johnson et al is to improve properties for filtering gaseous streams carrying a mist. The improved systems will remove substantially all mist and have an extended life (Col. 2, line 7-10).

Therefore, it would have been obvious at time of the invention to use the filtration arrangements of Johnsons et al for the mist extraction of Wisting in order to attain the cited above advantages. Furthermore, it would be obvious to have multiple tubular filter elements in the chamber because duplication parts renders obvious. *In re Harza, 274 F.2d 669, 124 USPQ 378)CCPA 1960).*

As to spray means being an annular member with a plurality of nozzles which spray the water horizontally onto the inner circumferential surface of main body and onto the outer circumferential surface of partition wall in **claim 16**, as shown in the Figure 4 and 6 of Pircon (US 4120670), it reads on the horizontal spray. It would be obvious to have several spray nozzles located above the air stream input as shown in the Figure 4 of Pircon (US 4120670) because the impinger area would be the whole circular areas of inner circumferential of main body and outer circumferential of inner tube so that the spraying covers the entire impinger area. Also, it would be obvious to have an annular member with a plurality of nozzles because design change does not affect the functions. MPEP §§ 2144.04.

(6). **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wisting (US 3989488) in view of Pircon (US 41290670) and Johnson et al (US 7115150B2), further in view of Labadie (US 4786293).

As to filter element comprising a plurality of backwashing valves mounted within top space and respectively arranged vertically above openings of tubular filter elements in claim 15, Wisting **does not teach** the backwashing valve as claimed.

However, Labadie (US 4786293) **teaches** smart controller for reverse pulse air filter (Title). When the pressure differential across the air filter is greater than or equal to the reference set point pressure differential, a cleaning cycle is initiated (Abstract, line 5-8). As shown in Figures 3 & 4, the valve associated with each tubular air filter is illustrated which reads on the limitations of instant claim.

The advantage of using backwashing valve for the air filter is to to clean the filter and to maximize the life expectancy of an air filter (Col. 2, line 31-33).

Therefore, it would have been obvious at time of the invention to install backwashing valve as disclosed by Labadie for the dust collector of Wisting in order to attain the advantage herein above.

Allowable Subject Matter

(7). **Claims 3-5, 7-8, 10-12** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims because the design of straight fins overcomes prior arts cited above.

Response to Arguments

(8). Applicant's arguments filed on 07/21/2008 have been fully considered but they are not persuasive.

Applicant asserts that the water extractors 50 and 76 is water removal. Water must reach 50 and 76 otherwise they would not be water or moisture extractors and would serve no known purpose. accordingly, if a filter were to be installed downstream of the cyclone, i.e. downstream of scrubber chambers 26,27 and 28, that filter would be wetted and would become clogged right away and any air flow across the filter would have a very large pressure drop (page 8 & 9, current Remarks).

Although Applicant uses filter in the downstream of outlet conduit and water is not used to spray the gas stream in Applicant's disclosure, the water vapor generated by water film will be carried away by the cleaned gas. It is questionable that filter of Applicant will stay dry. Moreover, the water extraction means can be a pleated filter configuration with multiple layers to remove mist as evidenced by Johnson et al (US 7115150B2).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu
Art Unit: 1797
Date: October 1, 2008

/Duane S. Smith/
Supervisory Patent Examiner, Art Unit 1797